A PLAN FOR RESTORATION AND RECOVERY OF AQUATIC SPECIES IN ALABAMA

STRATEGIC HABITAT UNITS

Locust Fork, Swann Bridge

DEVELOPING A STRATEGIC PLAN FOR NATIONAL CHAMPIONSHIPS

"It's all about the team"

"It's all about the process"

The Team

Strategic Habitat Unit (SHU) team
= Alabama Rivers and Streams Network

Alabama Clean Water Partnership

…to study, manage, and develop our water resources in a scientific and comprehensive way to minimize their degradation, maximize their availability for all users, and restore and recover aquatic species.

Clean water for our future – a key to a prosperous Alabama

Needs

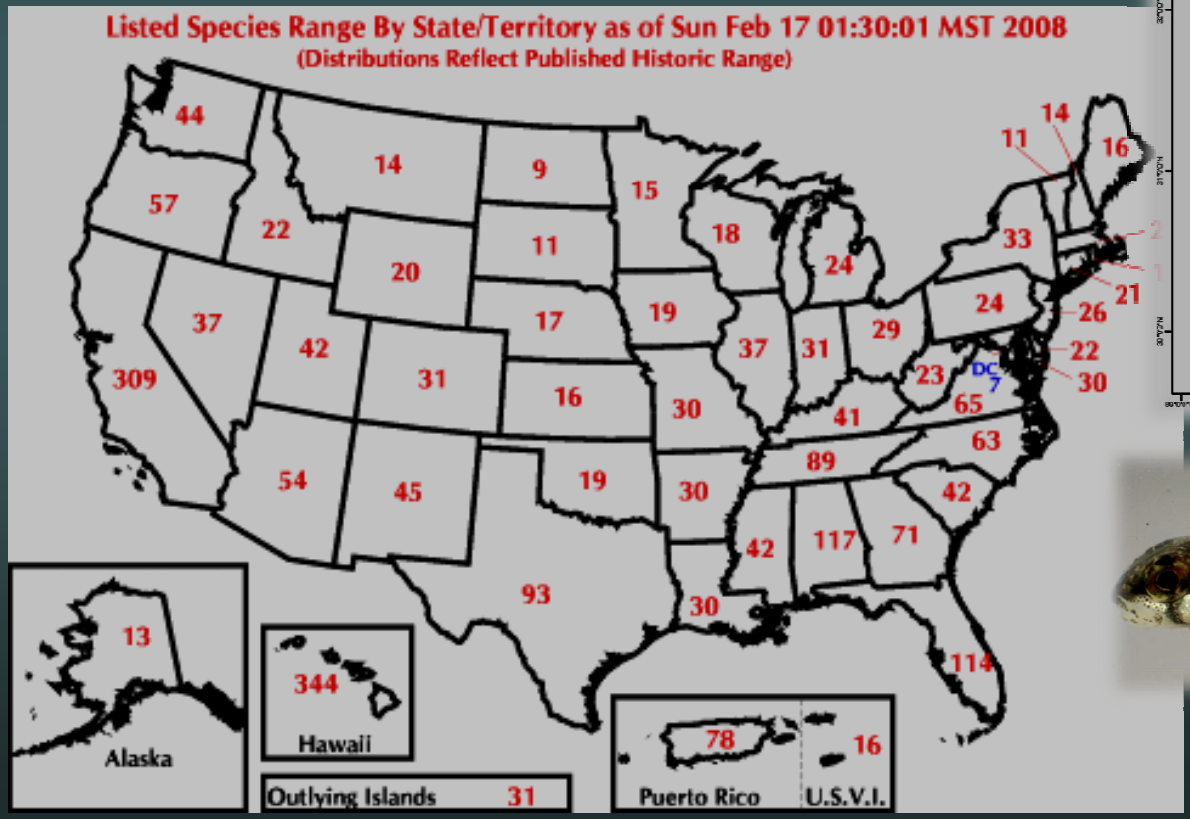
- *Ensure adequate water supplies for the future*
- *Manage watersheds for water quantity and quality*
- *Restore water quality*
- *Restore habitat*
- *Recover E&T species*

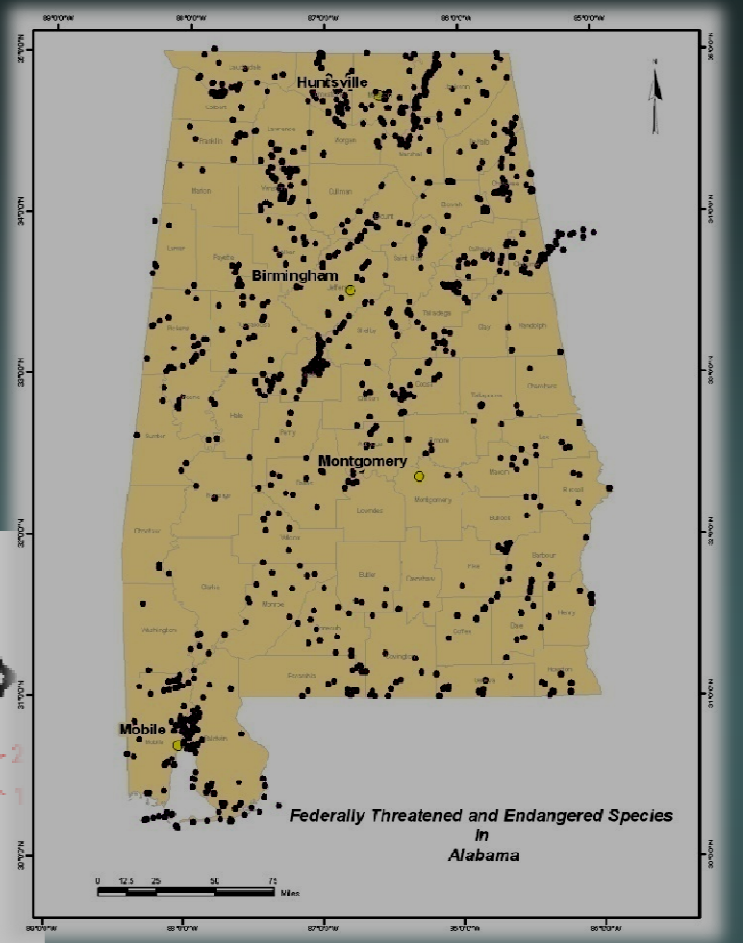
Tools

- *Clean Water Act*
- *Farm Bill*
- *Endangered Species Act*
- *Watershed partnerships*
- *SHUs*
- *Interdisciplinary watershed science*

Framework Partners Money

Current and Increasing Number of Aquatic Listed Species





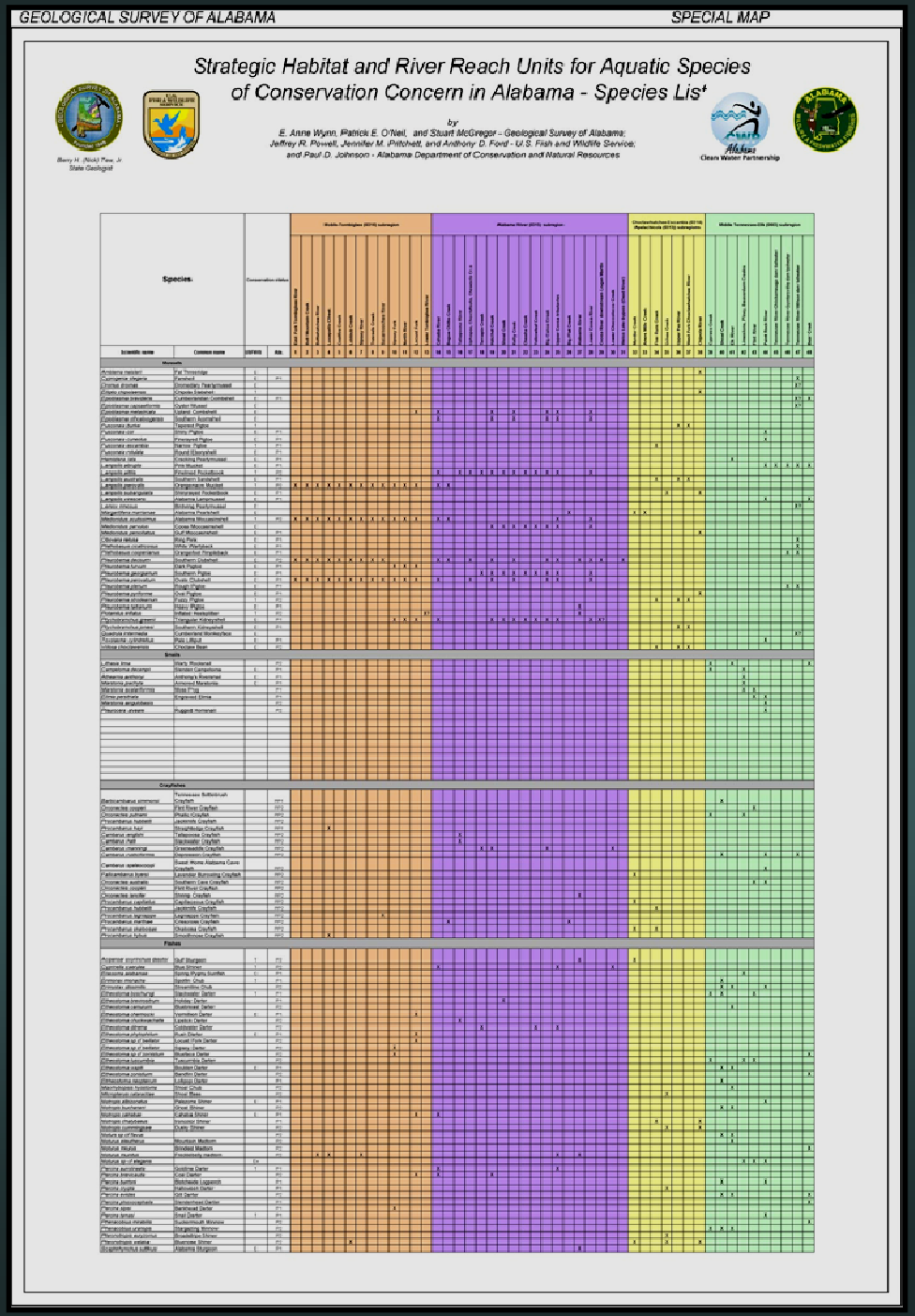
Trispot Darter, Etheostoma trisella

St. Clair Co, Ala.

Endangered, Threatened, Candidate, Exirpated, P1, P2

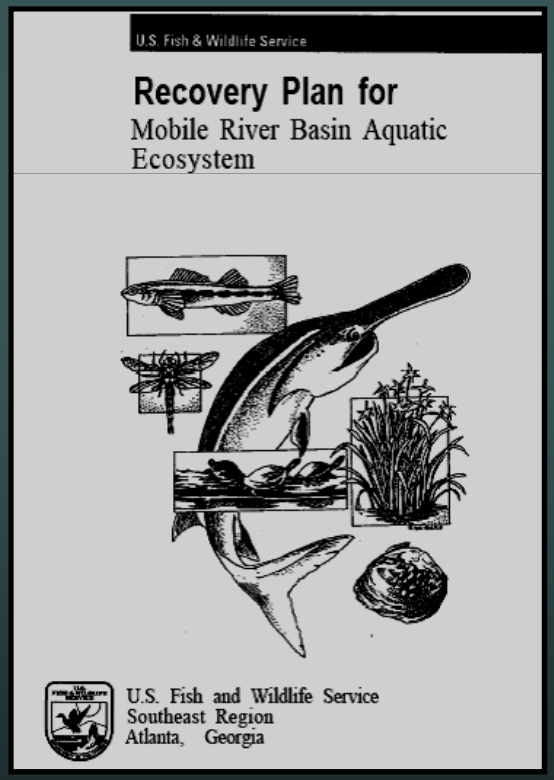
Total 201 species

- Mussels – 70
- Snails – 51
- Crayfishes – 18
- Fishes – 51
- Herptiles – 11

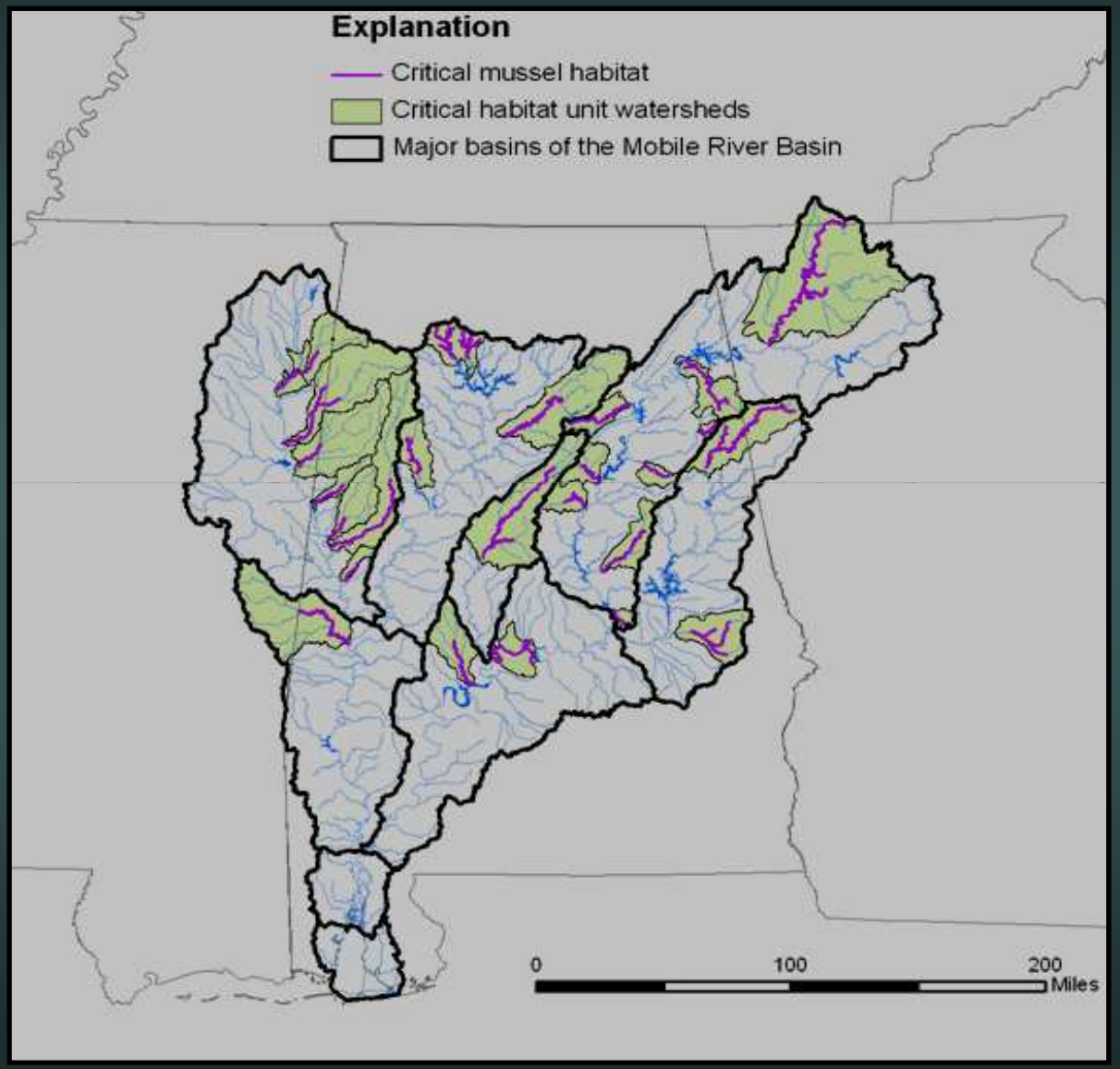


Initial Steps

Multispecies Recovery Plan 2000



Critical Habitat Designation 2004



Critical Habitat Map 2010

GEOLOGICAL SURVEY OF ALABAMA

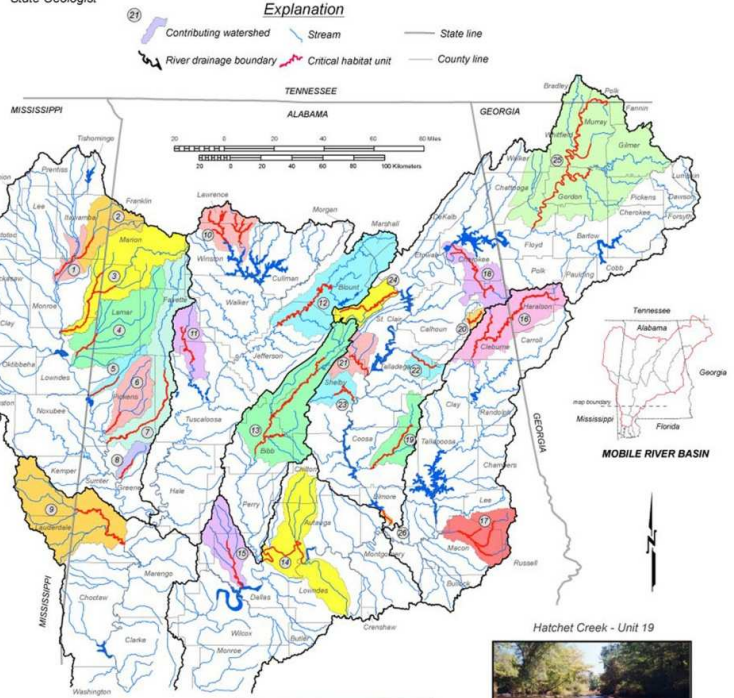
SPECIAL MAP 247

Critical Habitat Units for Threatened and Endangered Mussels in the Mobile River Basin

by Patrick E. O'Neil, Stuart W. McGregor, and E. Anne Wynn of the Geological Survey of Alabama
and Jeffrey R. Powell of the U.S. Fish and Wildlife Service

Berry H. (Nick) Tew, Jr.
State Geologist

Prepared in cooperation with:



Borden Creek - Unit 10

Cahaba River - Unit 13

Hatchet Creek - Unit 19

Locust Fork - Unit 12

The U.S. Fish and Wildlife Service has designated 26 river and stream segments (units) in the Mobile River Basin (69 FR 40084) as critical habitat for three threatened and eight endangered freshwater mussel species (table 1) under the Endangered Species Act of 1973, as amended. The habitat units encompass approximately 1,093 miles (1,760 kilometers) of stream and river channels in four states. Although this is a small portion of each species' historic range, the habitat units include a significant part of the Mobile River Basin's remaining high-quality, free-flowing rivers and streams and reflect the variety of small stream to large river habitats once occupied by these species. The 26 habitat units were selected based on best available information about the essential habitat components required by these 11 species including: (1) geomorphically stable stream and river banks and channels; (2) a stream flow regime sufficient for normal behavior, growth, and survival of all life stages of mussels and their fish hosts; (3) acceptable water-quality conditions necessary for normal behavior, growth, and viability of all life stages; (4) sand, gravel, and (or) cobble substrates with low amounts of fine sediment and low amounts of attached filamentous algae; (5) the presence of fish hosts with adequate living, foraging, and spawning areas; and (6) few or no competitive or predaceous nonnative species. Detailed descriptions of critical habitat reaches given below (table 2) allow accurate location on larger scale maps. The colored polygons on the map to the left represent contributing watershed areas to the critical habitat unit reaches depicted in red.

Table 1. Threatened and endangered freshwater mussel species in the Mobile River Basin.

Species		Status [1]	Critical Habitat Unit in the Mobile River Basin																							
Scientific name	Common name		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Epioblasma metastriata	upland combshell	E											X	X							X	X		X			X	X
Epioblasma othcaloogensis	southern acornshell	E													X						X	X		X			X	X
Lampsilis altilis	finelined pocketbook	T													X			X	X	X	X	X	X	X	X	X	X	X
Lampsilis perovalis	orange-nacre mucket	T	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X											
Medionidus acutissimus	Alabama moccasinshell	T	X	X	X	X	X	X	X	X	X	X	X	X	X		X										X	X
Medionidus parvulus	Coosa moccasinshell	E																			X	X	X	X	X	X	X	X
Pleurobema decisum	southern clubshell	E	X	X	X	X	X	X	X	X	X				X	X	X		X	X	X		X			X	X	X
Pleurobema furvum	dark pigtoe	E										X	X	X														
Pleurobema georgianum	southern pigtoe	E																			X	X	X	X	X	X	X	X
Pleurobema perovatum	ovate clubshell	E	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X		X			X	X	X
Ptychobranchus greenii	triangular kidneyshell	E										X	X	X	X						X	X	X	X	X	X	X	X

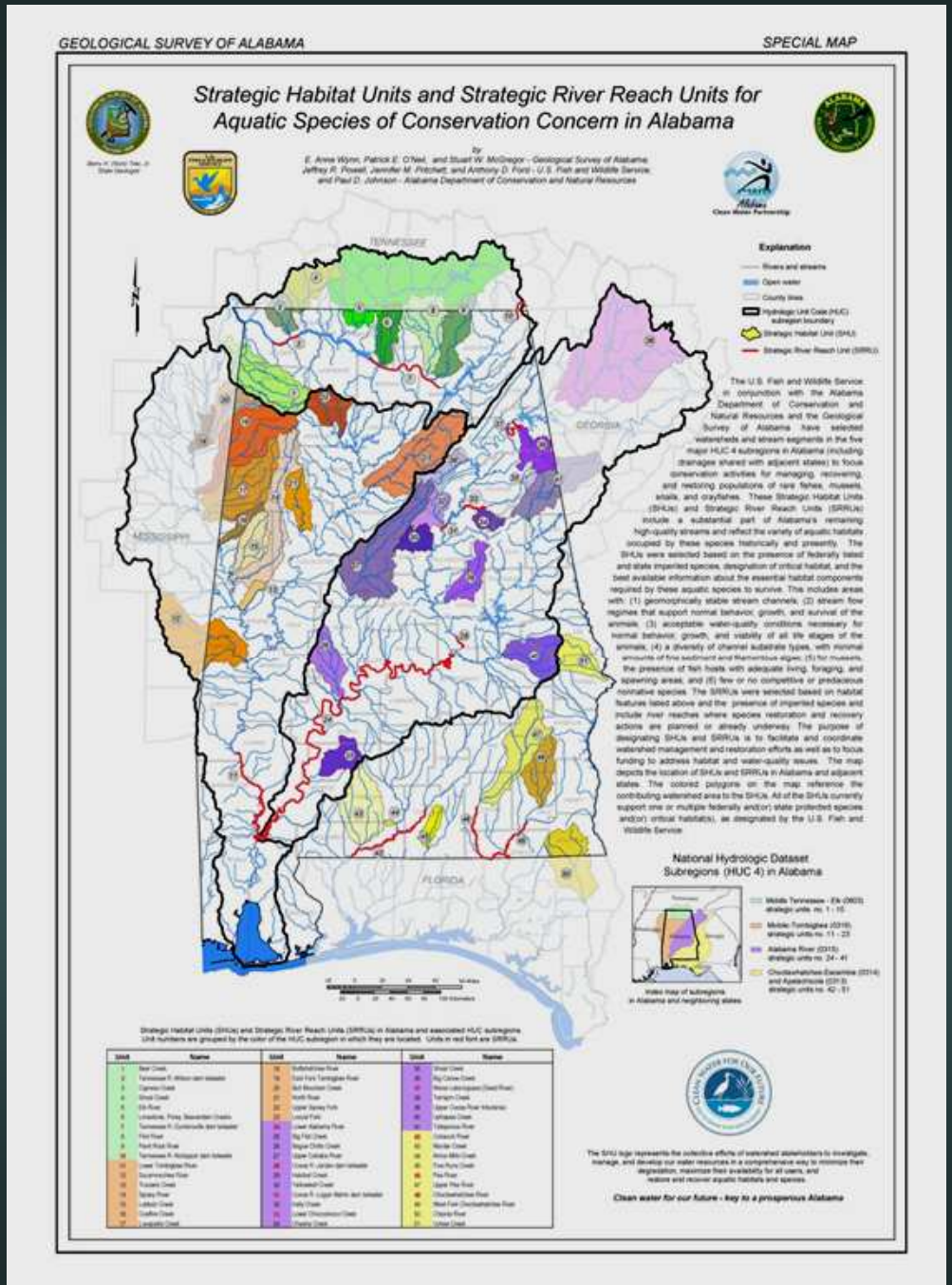
[1] E=endangered; T=threatened

Table 2. Detailed descriptions of critical habitat units in the Mobile River Basin.

Critical Habitat Unit	Name	State/Counties	Reach
1	East Fork Tombigbee River	**Miss.** Monroe, Itawamba	East Fork of Tombigbee River main stem from Miss. Hwy. 278 upstream to the confluence of Mill Creek.
2	Bull Mountain Creek	**Miss.** Itawamba	Bull Mountain Creek main stem from Miss. Hwy. 25 upstream to U.S. Hwy. 78.
3	Buttahatchee River and Sipsey Creek	**Miss.** Lowndes, Monroe; **Ala.** Lamar	Buttahatchee River main stem from its confluence with Columbus Lake upstream to confluence of Beaver Creek.
4	Luxapallila Creek and Yellow Creek	**Miss.** Lowndes; **Ala.** Lamar	Sipsey Creek from its confluence with Buttahatchee River upstream to the Miss./Ala. state line. Luxapallila Creek main stem from Waterworks Road (Columbus) upstream to 0.6 mile above Steens Road. Yellow Creek main stem from its confluence with Luxapallila Creek upstream to confluence of Cut Bank Creek.
5	Coalfire Creek	**Ala.** Pickens	Coalfire Creek main stem from its confluence with Aliceville Lake upstream to U.S. Hwy. 82.
6	Lubbub Creek	**Ala.** Pickens	Lubbub Creek main stem from its confluence with Gainesville Lake upstream to confluence of Little Lubbub Creek.
7	Sipsey River	**Ala.** Greene, Pickens, Tuscaloosa	Sipsey River main stem from its confluence with Gainesville Lake upstream to Ala. Hwy. 171.
8	Trussels Creek	**Ala.** Greene	Trussels Creek main stem from its confluence with Demopolis Lake upstream to Ala. Hwy. 14.
9	Sucarnoochee River	**Ala.** Sumter	Sucarnoochee River main stem from its confluence with the Tombigbee River upstream to the Miss./Ala. state line.
10	Sipsey Fork and tributaries	**Ala.** Winston, Lawrence	Sipsey Fork main stem from sec. 11/12 line (T. 10 S., R. 8 W.) upstream to confluence of Hubbard Creek. Thompson Creek from its confluence with Hubbard Creek upstream to sec. 2 line (T. 8 S., R. 9 W.). Brushy Creek from the confluence of Glover Creek upstream to sec. 9 (T. 8 S., R. 7 W.). Capsey Creek from its confluence with Brushy Creek upstream to confluence of Turkey Creek. Rush Creek from its confluence with Brushy Creek upstream to Winston/Lawrence County line. Brown Creek from its confluence with Rush Creek upstream to sec. 24 line (T. 8 S., R. 7 W.). Beech Creek from its confluence with Brushy Creek to confluence of East and West Forks. Caney Creek and North Fork Caney Creek from their confluence with Sipsey Fork upstream to sec. 14 line (T. 9 S., R. 9 W.). Borden Creek from its confluence with Sipsey Fork upstream to confluence of Montgomery Creek. Flannagin Creek from its confluence with Borden Creek upstream to confluence of Dry Creek.
11	North River and Clear Creek	**Ala.** Tuscaloosa, Fayette	North River main stem from Tuscaloosa County Road 38 upstream to confluence of Ellis Creek. Clear Creek from its confluence with North River to Bays Lake Dam in Fayette County.
12	Locust Fork and Little Warrior River	**Ala.** Jefferson, Blount	Locust Fork main stem from U.S. Hwy. 78 upstream to confluence with Little Warrior River Little Warrior River from its confluence with Locust Fork upstream to confluence of Calvert Prong and Blackburn Fork.
13	Cahaba River and Little Cahaba River	**Ala.** Jefferson, Shelby, Bibb	Cahaba River from U.S. Hwy. 82 upstream to Jefferson County Road 143. Little Cahaba River from its confluence with Cahaba River upstream to confluence of Mahan and Shoal Creeks.
14	Alabama River	**Ala.** Autauga, Lowndes, Dallas	Alabama River from its confluence with Cahaba River upstream to confluence of Big Swamp Creek.
15	Bogue Chitto Creek	**Ala.** Dallas	Bogue Chitto Creek main stem from its confluence with the Alabama River upstream to U.S. Hwy. 80.
16	Tallapoosa River and Cane Creek	**Ala.** Cleburne; **Ga.** Paulding, Haralson	Tallapoosa River main stem from U.S. Hwy. 431 upstream to confluence of McClendon and Mud Creeks. Cane Creek from its confluence with the Tallapoosa River upstream to sec. 4 northern line (T. 15 S., R. 11 E.).
17	Uphapee, Choctafaula, and Chewacla Creeks	**Ala.** Macon, Lee	Uphapee Creek from Ala. Hwy. 199 upstream to confluence of Opintlocco and Chewacla Creeks. Choctafaula Creek from its confluence with Uphapee Creek upstream to Macon County Road 54. Chewacla Creek from its confluence with Opintlocco Creek upstream to Lee County Road 159. Opintlocco Creek from its confluence with Chewacla Creek upstream to Macon County Road 79.
18	Coosa River and Terrapin Creek	**Ala.** Cherokee, Calhoun, Cleburne	Coosa River main stem (old river channel) from power line crossing southeast of Maple Grove upstream to Weiss Dam. Terrapin Creek from its confluence with old Coosa River channel upstream to Cleburne County Road 49. South Fork Terrapin Creek from its confluence with Terrapin Creek upstream to Cleburne County Road 55.
19	Hatchet Creek	**Ala.** Coosa, Clay	Hatchet Creek main stem from confluence of Swamp Creek upstream to Clay County Road 4.
20	Shoal Creek	**Ala.** Calhoun, Cleburne	Shoal Creek main stem from Whitesides Mill Lake upstream to the tailwater of Coleman Lake Dam.
21	Kelly Creek and Shoal Creek	**Ala.** Shelby, St. Clair	Kelly Creek main stem from its confluence with Coosa River upstream to confluence of Shoal Creek. Shoal Creek main stem from its confluence with Kelly Creek upstream to St. Clair/Shelby County line.
22	Cheaha Creek	**Ala.** Clay, Talladega	Cheaha Creek main stem from its confluence with Choccolocco Creek upstream to tailwaters of Chinnabee Lake Dam.
23	Yellowleaf Creek and Muddy Prong	**Ala.** Shelby	Yellowleaf Creek main stem from Ala. Hwy. 25 upstream to Shelby County Road 49. Muddy Prong main stem from its confluence with Yellowleaf Creek upstream to U.S. Hwy. 280.
24	Big Canoe Creek	**Ala.** St. Clair	Big Canoe Creek main stem from its confluence with Little Canoe Creek upstream to confluence of Fall Branch.
25	Oostanaula, Coosawattee, and Conasauga Rivers and Floyd Creek	**Ga.** Floyd, Gordon, Whitfield, Murray **Tenn.** Bradley, Polk	Oostanaula River main stem from confluence with Etowah River upstream to confluence of Conasauga and Coosawattee Rivers. Coosawattee River from its confluence with the Conasauga River upstream to Ga. Hwy. 136. Conasauga River main stem from its confluence with the Coosawattee River upstream to Murray County Road 2. Holly Creek main stem from its confluence with the Conasauga River upstream to confluence of Rock Creek.
26	Lower Coosa River	**Ala.** Elmore	Coosa River main stem from Ala. Hwy. 111 bridge upstream to Jordan Dam.

Critical Habitat Units become Strategic Habitat Units (SHUs)

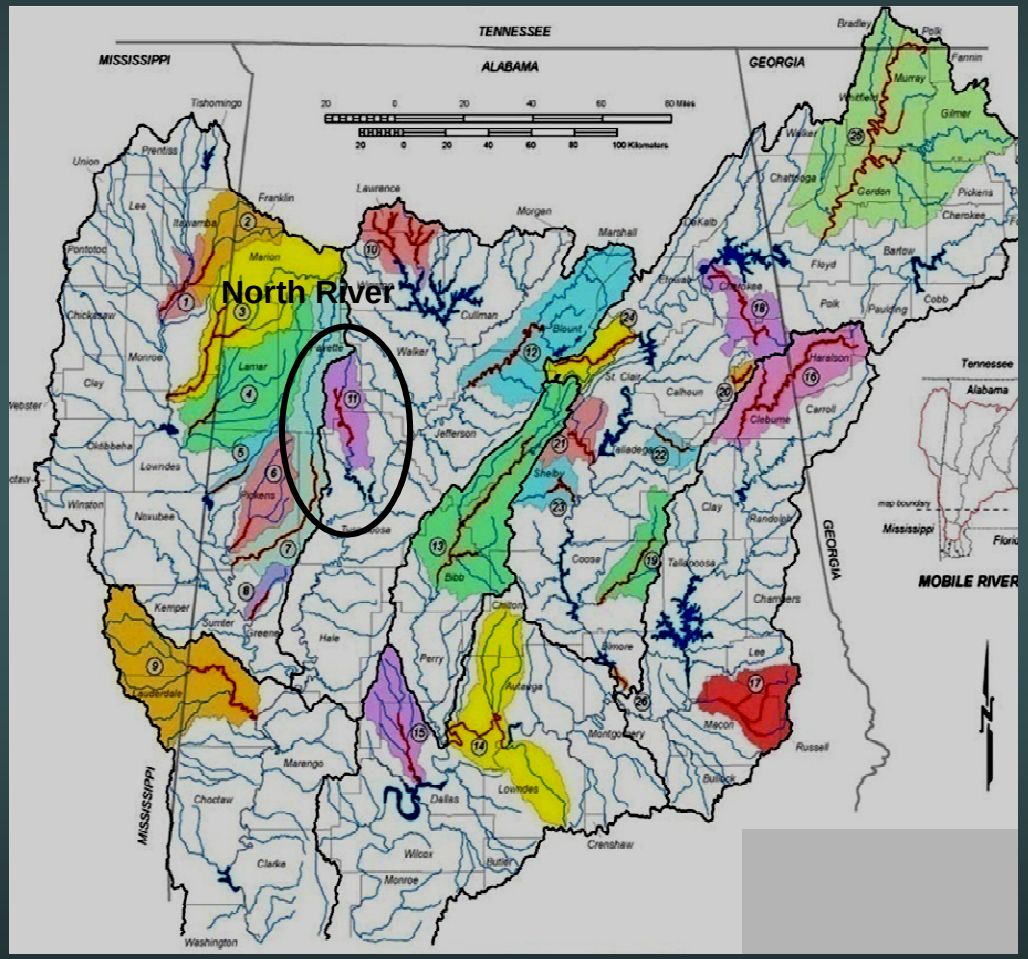
- *The SHU is a biological tool used to help prioritize and focus conservation activities and limited funding*
- *It serves as a biological layer for informing watershed restoration efforts*
- *The pilot project was in the North River SHU*



Statewide SHU Map 2012

The Process

1. Assessments
2. Restoration
3. Recovery
4. Monitoring

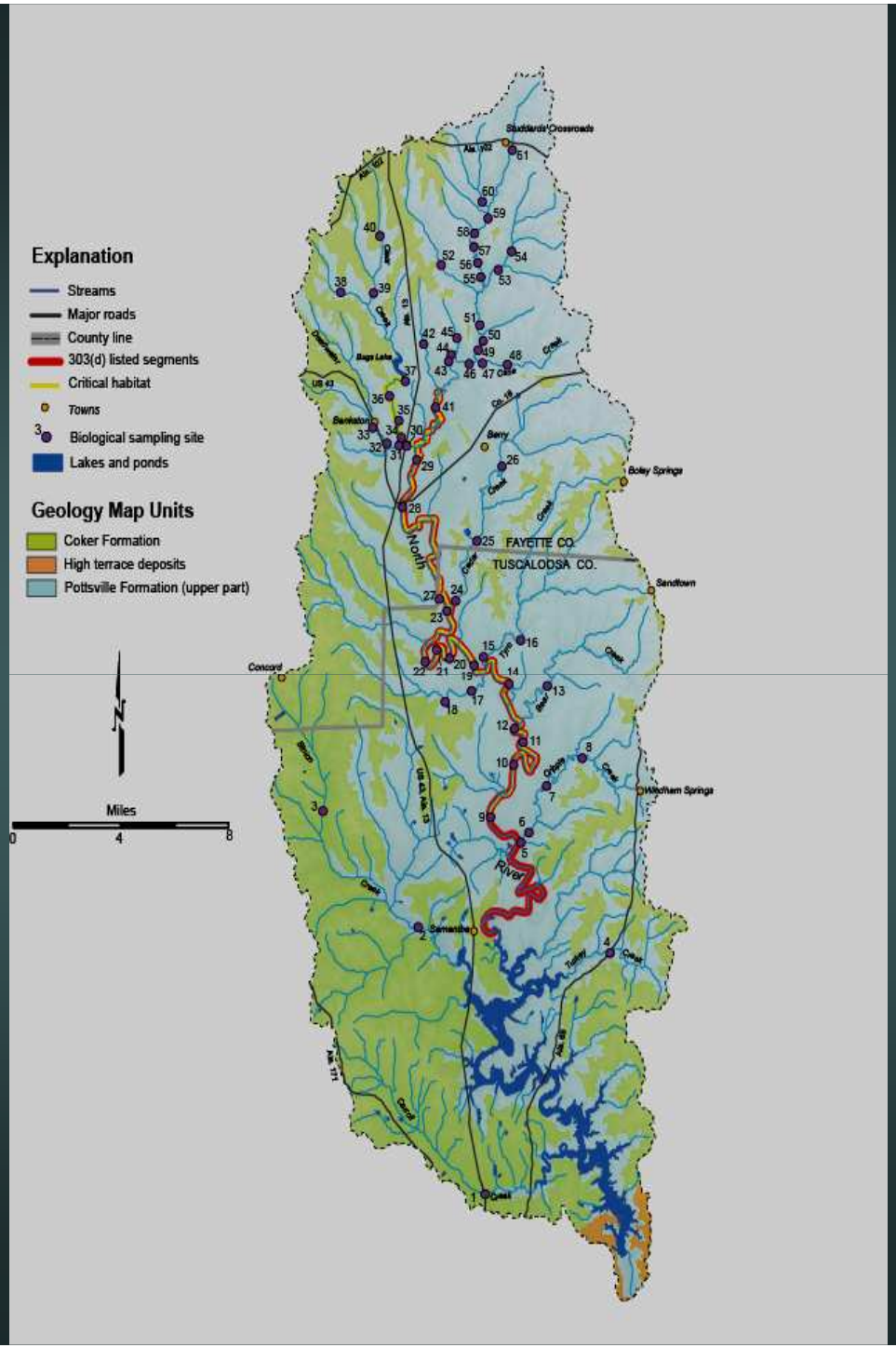


Assess
Restore
Recover
Monitor

Assess Restore Recover Monitor

"Backup Team"

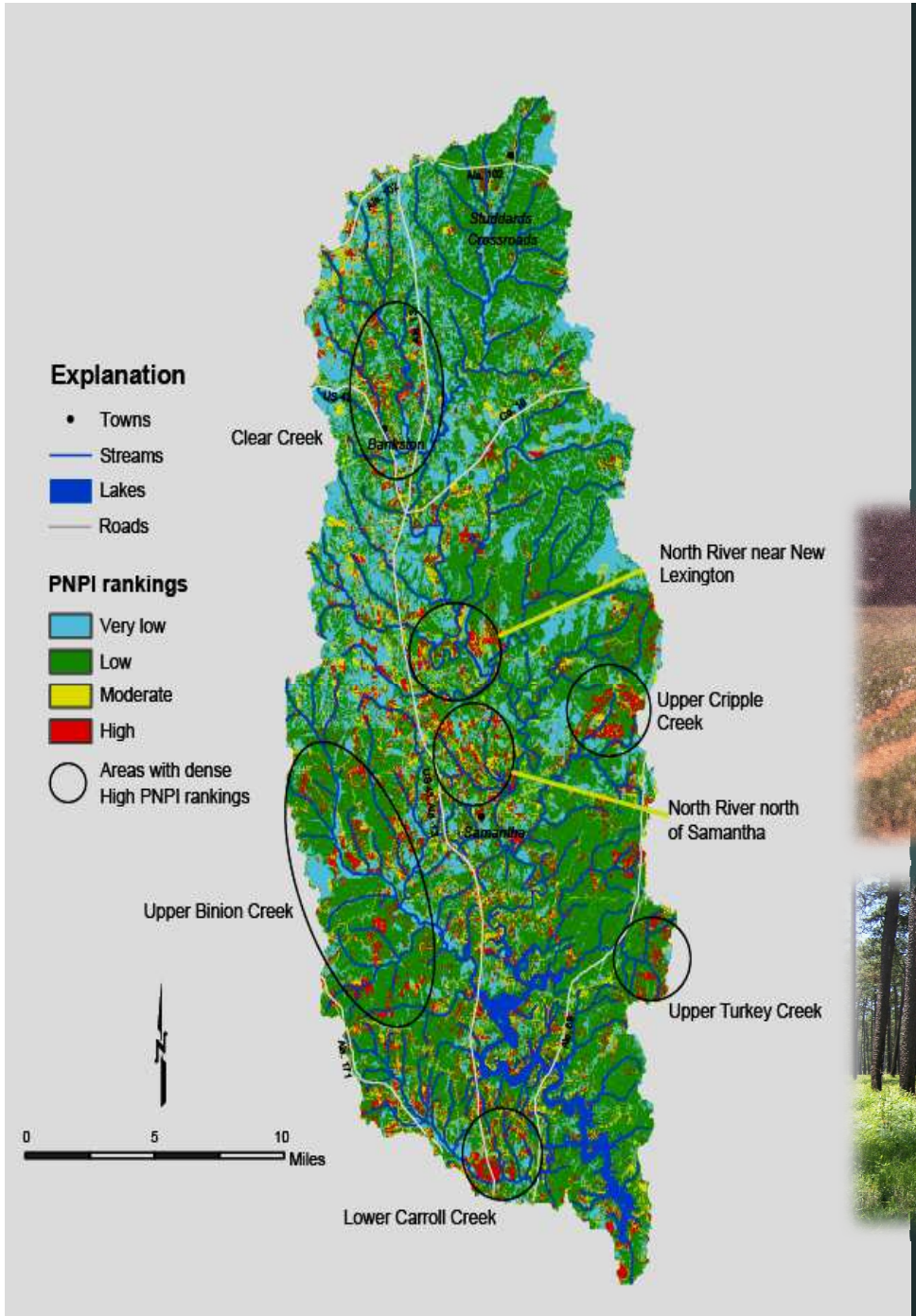
Bio Assessments



Excellent | Good | Fair | Poor

Number of mussel species		Biological condition		Main channel sites
1991-98	2008	1974-88	2008-09	
	3			4. North River at Cripple Creek mouth
7	6			8. North River at Co. Hwy 38
	2			9. North River US of CR 38
	0			10. North River near Bear Creek mouth
	3			11. North River at Bear Creek
	1			13. North River DS of Tyro Creek
3	1			17. North River at Wittson Bridge
3				18. North River DS of Tusc. Co. Hwy. 63
3				19. North River at Tusc. Co. Hwy. 63
2				20. North River US of Tusc. Co. Hwy. 63
8	1			21. North River at Cedar Creek mouth
7				23. North River US of Cedar Creek
5	2			24. North River at Ala. Hwy. 18
	0			25. North River DS of Clear Creek
4	3			34. North River at Co. Hwy. 30
1				35. North River DS of Fayette Co. dam site
2				36. North River at Fayette Co. dam site
3				38. North River DS of Cane Creek
2				41. North River near Laney Branch
4				42. North River DS of Jenkins Cemetery
3				43. North River US of Jenkins Cemetery
1				47. North River US of George Creek (1)
2				48. North River US of George Creek (2)
2				49. North River US of George Creek (3)
2	3			50. North River at Lowery Branch
3	2			51. North River at Fayette Co. Hwy. 63
0	0			53. North River at Ala. Hwy. 102

Potential Nonpoint Source Pollution Index (PNSPI)



Habitat Assessments

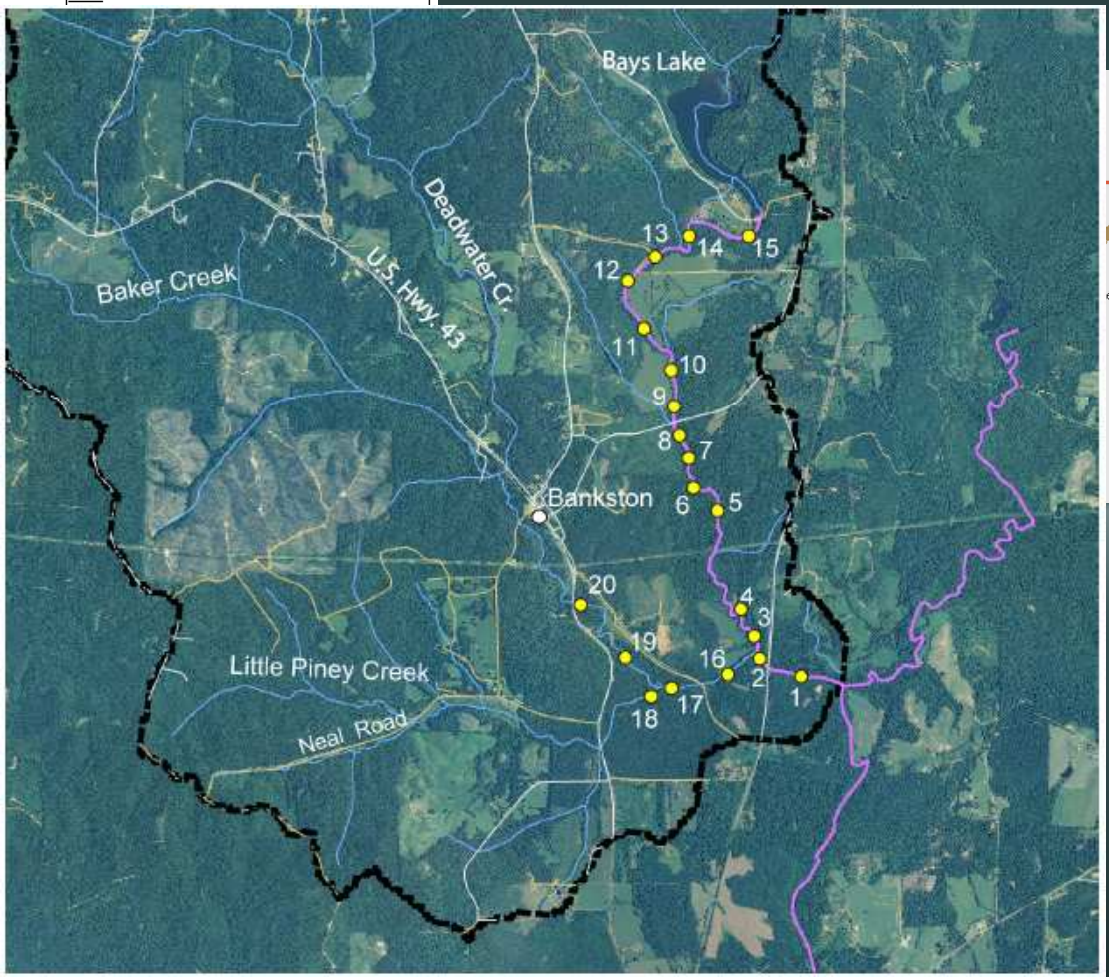
Clear Creek	SHU No.	21120307202	3.75
	Field No.	MWP120307-02	Habitat Threat Severity Index

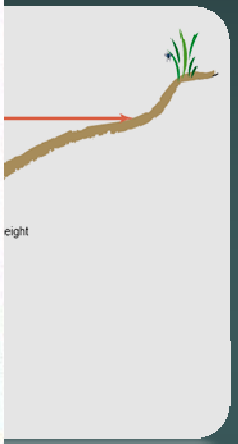
Description: U/S U.S. Hwy. 13 bridge at mouth of Deadwater Creek
State: Alabama
SHU - System: 21-Ncrth River
Lat/Lon: 33.6618 -87.65253
PLSS:

Risk factor	Ranking
1. Water odors	normal
2. Channel stability	fair
3. Channel alteration	none
4. Shoring structures	none
5. Fish passage barriers	none
6. Riparian buffer width	
Left bank	>100 ft
Right bank	>100 ft
7. Local nonpoint pollution	moderate
8. Floodplain access	
Left bank	partial
Right bank	full
9. Bank erosion	active
10. Pipe discharges	none
11. BEHI	moderate risk
Total Score	Low severity risk

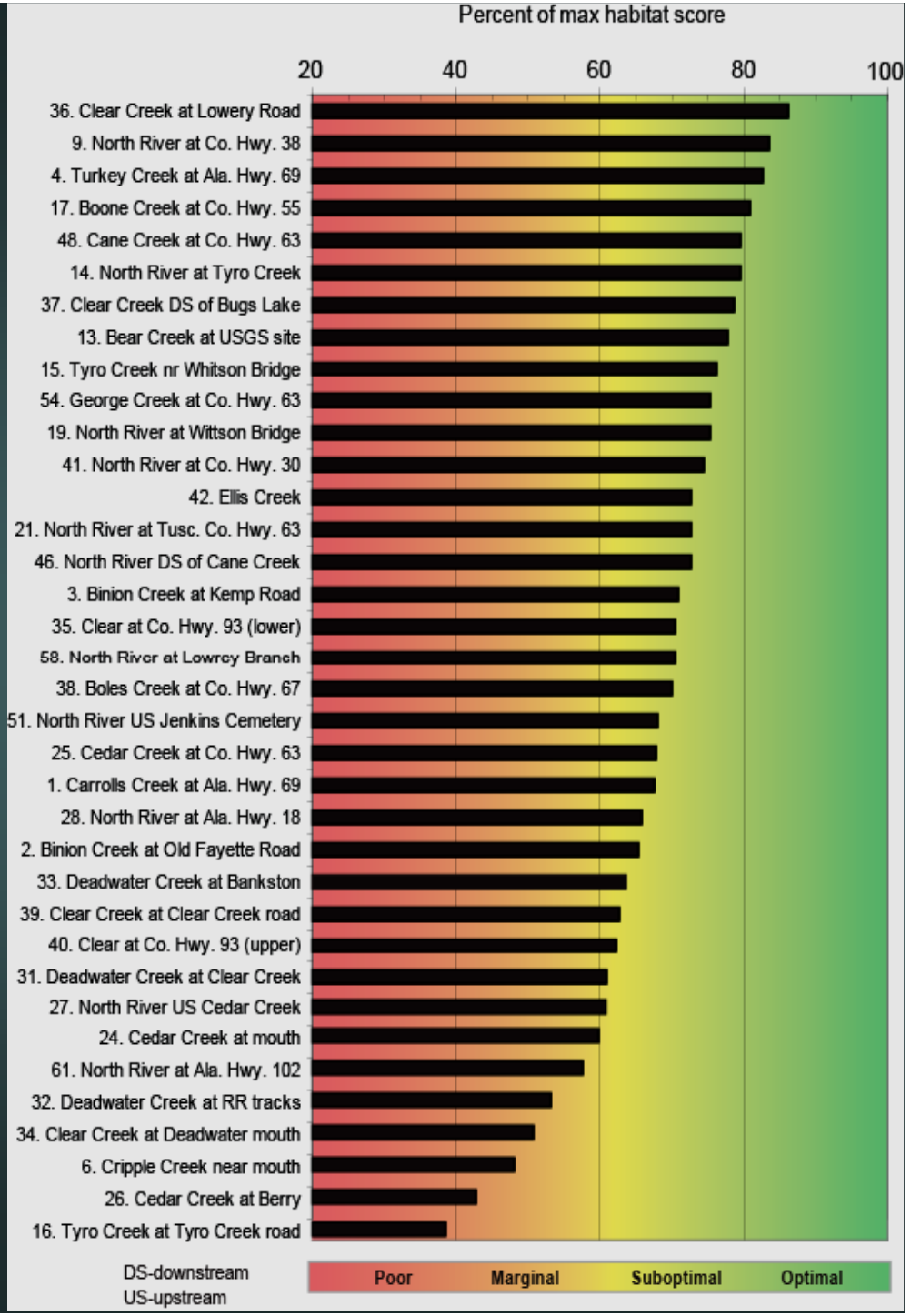
1. Looking upst

2. Locking down





Summary of Habitat Assessment Scores



Road Crossing Assessments

Clear Creek	SHU No.	21120321104	40
	Site No.	108	Sedimentation Risk Index

Description: at Clear Creek Road
SHU - System: 21-North River
Lat/Lon: 33.7364 -87.673
PLSS:

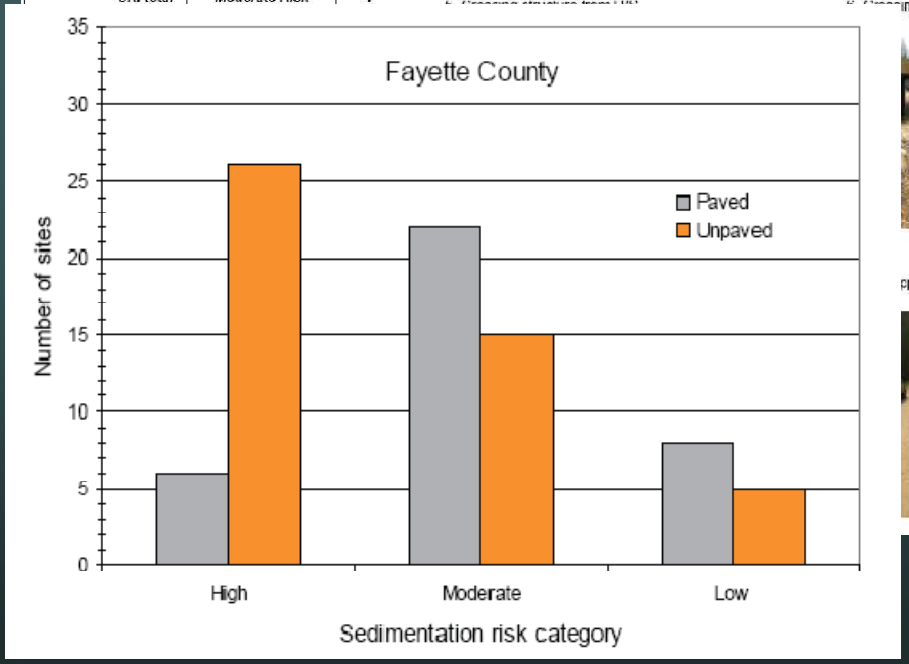
Field No. PEO120321-04
State: Alabama
County: Fayette
Date/Time: 21-Mar-12
Road name: Clear Creek

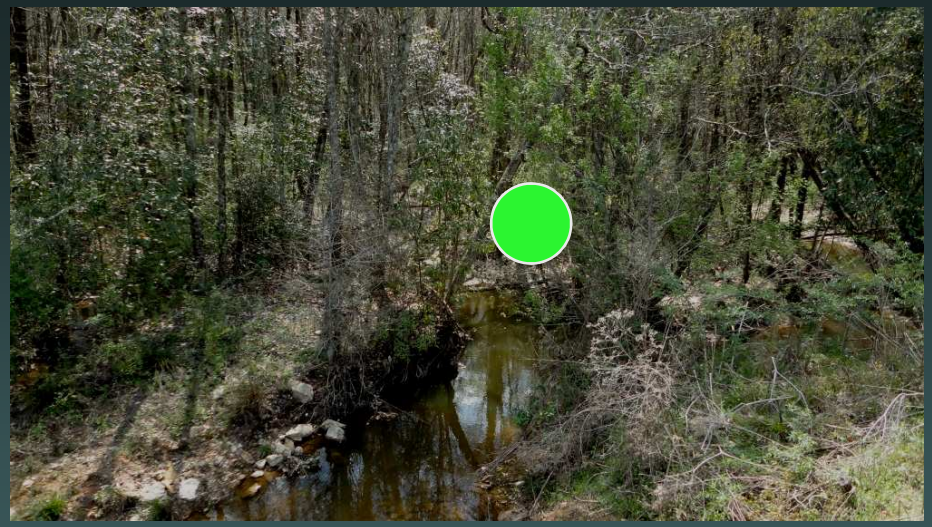
Risk factor	Ranking	Score
U/S channel morph.	F	1
D/S channel morph.	C	5
D/S Bank alteration	High	1
U/S skew angle (°)	<5	5
Crossing fill cond.	Vegetated	5
Inlet/Outlet cond.	No Impairment	5
Eroded vol. (mean yds^3)	17.2	5
K-factor	0.32	3
Approach slope (mean %)	0.0	1
Surface material	Aggregate	5
U/S left outlet	Bare Soil	0
U/S right outlet	Bare Soil	0
D/S left outlet	Bare Soil	0
D/S right outlet	Bare Soil	0
Outlet final score		1
U/S left ditch	Bare Soil	0
U/S right ditch	Vegetated	1
D/S left ditch	Vegetated	1
D/S right ditch	Bare Soil	0
Ditch final score		3
SRI total	Moderate Risk	4

1. U/S channel from crossing

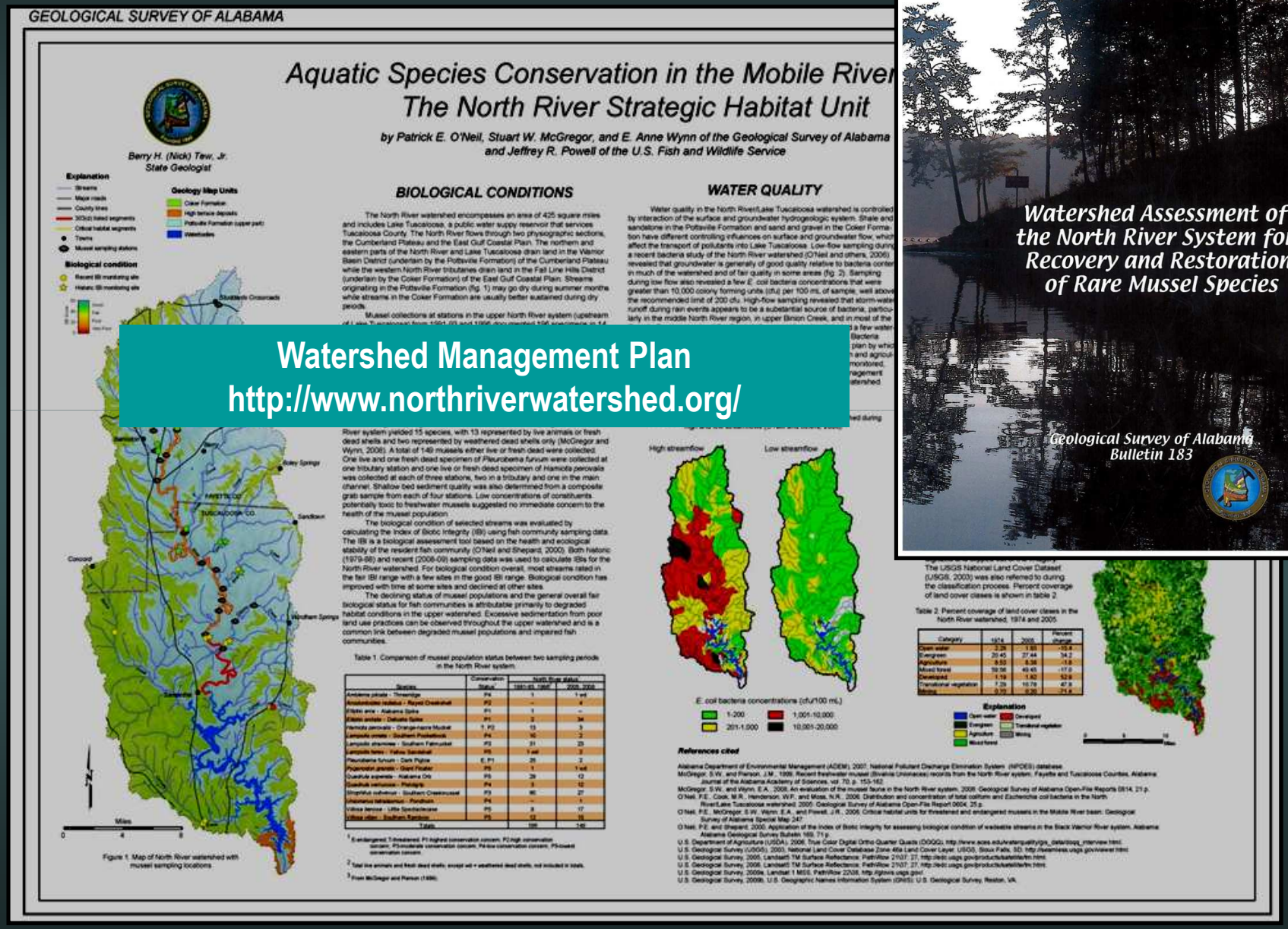
2. D/S channel from crossing

Clear Creek	SHU No.	21120321104	
	Site No.	108	Sedimen





North River Assessment Products


GEOLOGICAL SURVEY OF ALABAMA

Aquatic Species Conservation in the Mobile River
The North River Strategic Habitat Unit

by Patrick E. O'Neil, Stuart W. McGregor, and E. Anne Wynn of the Geological Survey of Alabama
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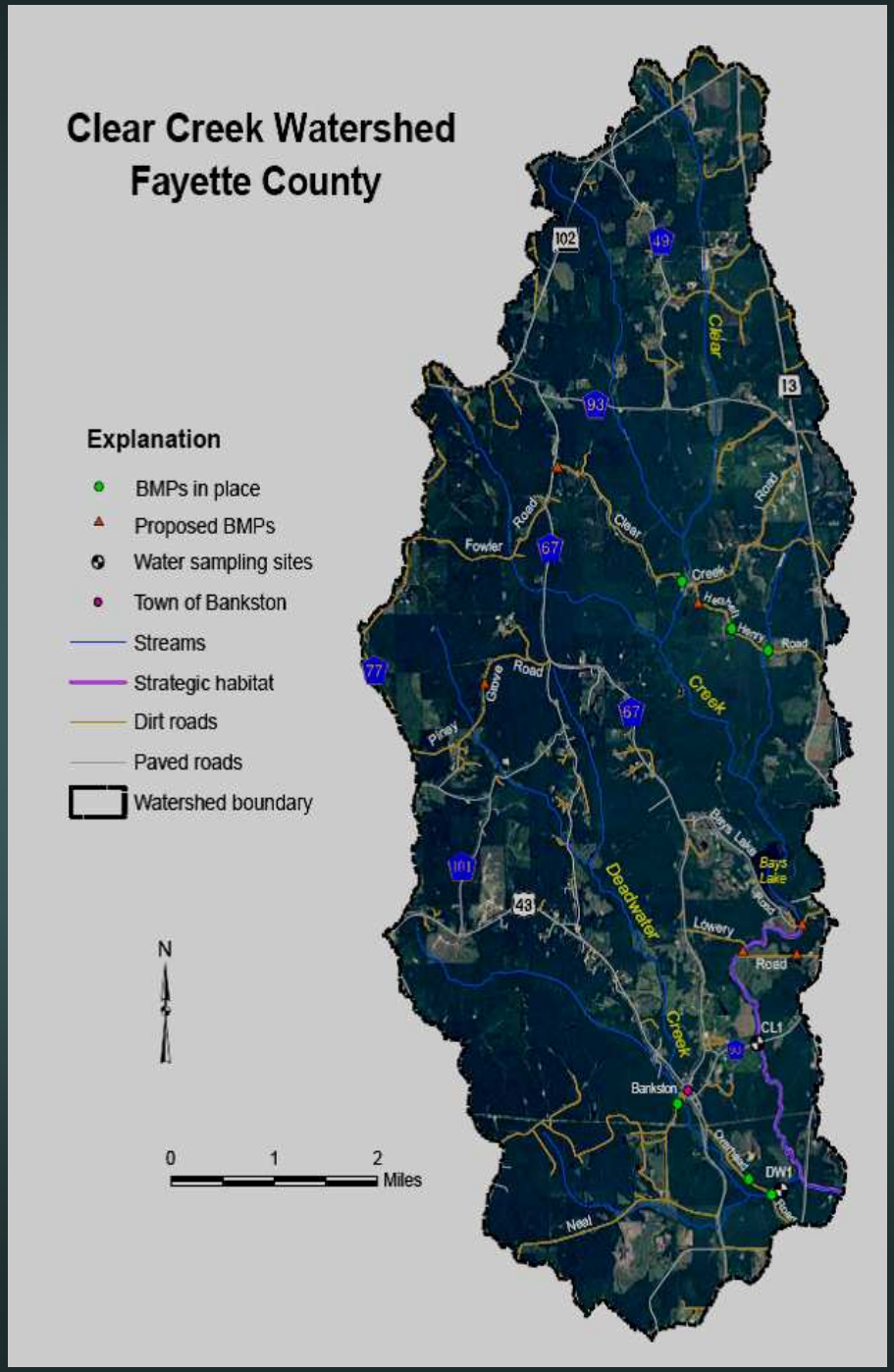
Berry H. (Nick) Tew, Jr.
State Geologist

BIOLOGICAL CONDITIONS

WATER QUALITY

Watershed Management Plan
http://www.northriverwatershed.org/



Assess
Restore
Recover
Monitor

BMP Sediment Reduction Totals

November 2011-August 2012

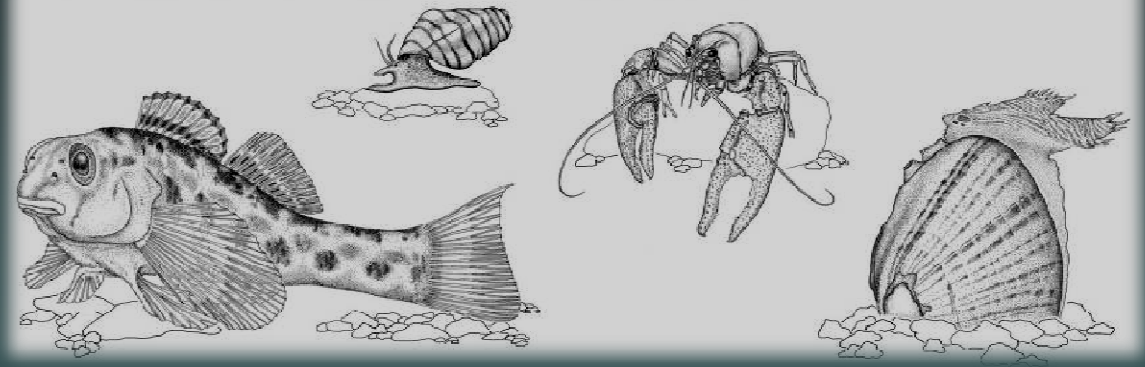
#1	0.91 Cubic Yards
#2	2.66 Cubic Yards
#3	1.53 Cubic Yards
#4	1.23 Cubic Yards
#5	1.32 Cubic Yards
#6	0.44 Cubic Yards
#7U	0.83 Cubic Yards
#7D	1.61 Cubic Yards
#8	1.03 Cubic Yards
#9	5.04 Cubic Yards
#10	0.47 Cubic Yards
#11	1.08 Cubic Yards
#12	0.71 Cubic Yards
#13	0.24 Cubic Yards

TOTAL Measurable Sediment Reduction in Clear and Deadwater Creeks

19.1 Cubic Yards @ 2,700 pounds/CuYd = 51,570 pounds = 25.8 Tons

Assess
Restore
Recover
Monitor

Alabama Aquatic Biodiversity Center



ALABAMA WILDLIFE & FRESHWATER FISHERIES

Restoration Plans for the Mobile Basin

Tiers for mussels and snails

JEFF TOWELL

Mobile River Basin Mollusk Recovery – January 2010

A PLAN FOR THE POPULATION RESTORATION AND CONSERVATION OF FRESHWATER MOLLUSKS OF THE MO

Prepared b

Mobile River Basin Mollusk

January 2

Snails

Mobile River Basin Mollusk Recovery – January 2010

Appendix II-B. List of snails considered to be conservation priorities in the Mobile River Basin. Tier assignments generally reflect the degree of immediate imperilment for each taxon. Taxon with high R/A potential are denoted with an asterisk (*).

#	Taxon	G Rank	Federal Status
	Tier 1:		
1.	*Antrorbis breweri*, Manitou Cavesnail	G1	
2.	*Clappia cahabensis*, Cahaba Pebblesnail *	G1	
3.	*Elimia bellacrenata*, Princess Elimia *	G1	
4.	*Elimia cochlearis*, Cockle Elimia *	G1	
5.	*Elimia crenatella*, Lacy Elimia	G1	Threatened
6.	*Elimia lachryma*, Teardrop Elimia	G1	
7.	*Elimia vanuxaminana*, Cobble Elimia	G1	
8.	*Leptoxis foremani*, Interrupted Rocksnail	G1	Candidate
9.	*Leptoxis plicata*, Plicate Rocksnail	G1	Endangered
10.	*Lepyrium showalteri*, Flat Pebblesnail *	G1	Endangered
11.	*Lioplax cyclostomaformis*, Cylindrical Lioplax	G1	Endangered
12.	*Marstonia* sp., Cahaba Pyrg	G1	
13.	*Pleurocera foremani*, Rough Hornsnail *	G1	Candidate
14.	*Pseudotryonia grahamae*, Salt Spring Hydrobe	G1	
15.	*Rhodacme elatior*, Domed Ancylid	G1	
16.	*Stiobia nana*, Sculpin Snail	G1	
	N = 16		
	Tier 2:		
17.	*Elimia melanoides*, Black Mudalia	G2	
18.	*Elimia ornata*, Ornate Elimia	G1	
19.	*Elimia striatula*, File Elimia *	G1	
20.	*Leptoxis taeniata*, Painted Rocksnail *	G1	Threatened
21.	*Marstonia herschleri*, Coosa Pyrg	G1	
	N = 5		
	Tier 3:		
22.	*Elimia ampla*, Ample Elimia	G2	
23.	*Elimia annettae*, Lilyshoals Elimia *	G2	
24.	*Elimia hydei*, Gladiator Elimia *	G2	
25.	*Elimia showalteri*, Compact Elimia *	G2	
26.	*Elimia varians*, Puzzle Elimia	G2	
27.	*Elimia variata*, Squat Elimia	G2	
28.	*Leptoxis ampla*, Round Rocksnail *	G2	Threatened
29.	*Leptoxis picta*, Spotted Rocksnail	G2	Candidate
30.	*Tulotoma magnifica*, Tulotoma *	G2	Endangered
	N = 9		

* Proposed June 29, 2009 (74 FR 123:31114)

17

Mussels

Mobile River Basin Mollusk Recovery – January 2010

Appendix II-A. List of mussels considered to be conservation priorities in the Mobile River Basin. Tier assignments generally reflect the degree of immediate imperilment for each taxon. Taxon with high R/A potential are denoted with an asterisk (*).

#	Taxon	G Rank	Federal Status
	Tier 1:		
1.	*Epioblasma penita*, Southern Combshell	G1	Endangered
2.	*Ligumia recta*, Black Sandshell	G4	
3.	*Margaritifera marrianae*, Alabama Pearlshell	G1	Candidate
4.	*Medionidus parvulus*, Coosa Moccasinshell	G1	Endangered
5.	*Pleurobema athearni*, Canoe Creek Pigtoe	G1	
6.	*Pleurobema hanleyianum*, Georgia Pigtoe	G1	Candidate
7.	*Pleurobema rubellum*, Warrior Pigtoe	G1	Endangered
8.	*Pleurobema taitianum*, Heavy Pigtoe	G1	Endangered
	N = 8		
	Tier 2:		
9.	*Elliptio arca*, Alabama Spike	G2	
10.	*Elliptio arctata*, Delicate Spike	G2	
11.	*Medionidus acutissimus*, Alabama Moccasinshell *	G2	Threatened
12.	*Obovaria jacksoniana*, Southern Hickorynut	G2	
13.	*Obovaria unicolor*, Alabama Hickorynut	G1	
14.	*Pleurobema georgianum*, Southern Pigtoe	G1	Endangered
15.	*Ptychobranchus foremanianus*, Alabama Kidneyshell	G1	
16.	*Ptychobranchus greenii*, Triangular Kidneyshell *	G1	Endangered
17.	*Strophitus connasaugaensis*, Alabama Creekmussel *	G3	
18.	*Toxolasma corvunculus*, Southern Purple Lilliput *	G1	
	N = 10		
	Tier 3:		
19.	*Amblema elliottii*, Coosa Fiveridge	G3	
20.	*Anodontoides radiatus*, Rayed Creekshell *	G3	
21.	*Hamiota altilis*, Finelined Pocketbook *	G2	Threatened
22.	*Hamiota perovalis*, Orangenacre Mucket *	G2	Threatened
23.	*Lasmigona etowaensis*, Southern Toesplitter *	G2	
24.	*Pleurobema decisum*, Southern Clubshell	G2	Endangered
25.	*Pleurobema perovatum*, Ovate Clubshell	G1	Endangered
26.	*Potamilus inflatus*, Alabama Heelsplitter *	G1	Endangered
	N = 8		

The following MRB federally listed mussels were not included in this prioritization because they are likely extinct.

Epioblasma metastriata, Upland Combshell, *Epioblasma othcaloogensis*, Southern Acornshell *Pleurobema curtum*, Black Clubshell, *Pleurobema marshalli*, Flat Pigtoe, *Quadrula stapes*, Stirrupshell

16

And the plan is nearly complete for the fishes…

Summary of 2012 Mollusk Reintroductions:

Tennessee Basin:

- *Alabama Lampmussel* - E
  Paint Rock - lower
  Bear Creek
  Elk River, TN
- *Cumberland Bean* – E
  Paint Rock
- *Cumberland Mocassinshell*
  Bear Creek
- *Rabbitsfoot* - C
  Limestone Creek
- *Painted Creekshell*
  Limestone Creek
- *Oystermussel* - E
  Paint Rock

Coosa Basin:

- *Alabama Rainbow*
  Choccolocco Creek
- *Alabama Creekmussel*
  Choccolocco Creek
- *Fine-lined Pocketbook* - T
  Little River
- *Interrupted Rocksnail* – E
  Coosa River

Cahaba Basin:

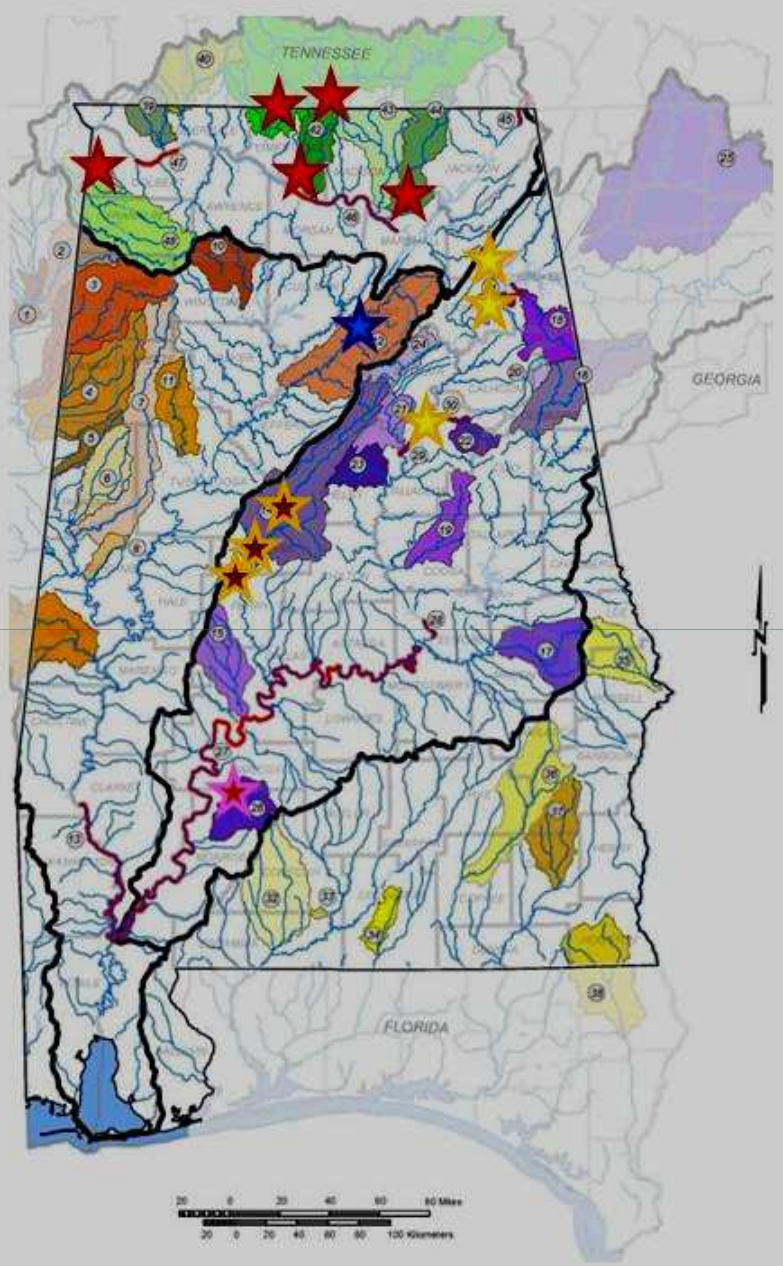
- *Southern Combshell* - E
  Cahaba River
- *Coosa Mocassinshell* - E
  Little Cahaba River
- *Spotted Rocksnail*
  Cahaba River

Warrior Basin:

- *Plicate Rocksnail* - E
  Locust Fork

Alabama Basin:

- *Orangenacre Mucket* - T
  Tallatchee Creek



Johnson et al 2012

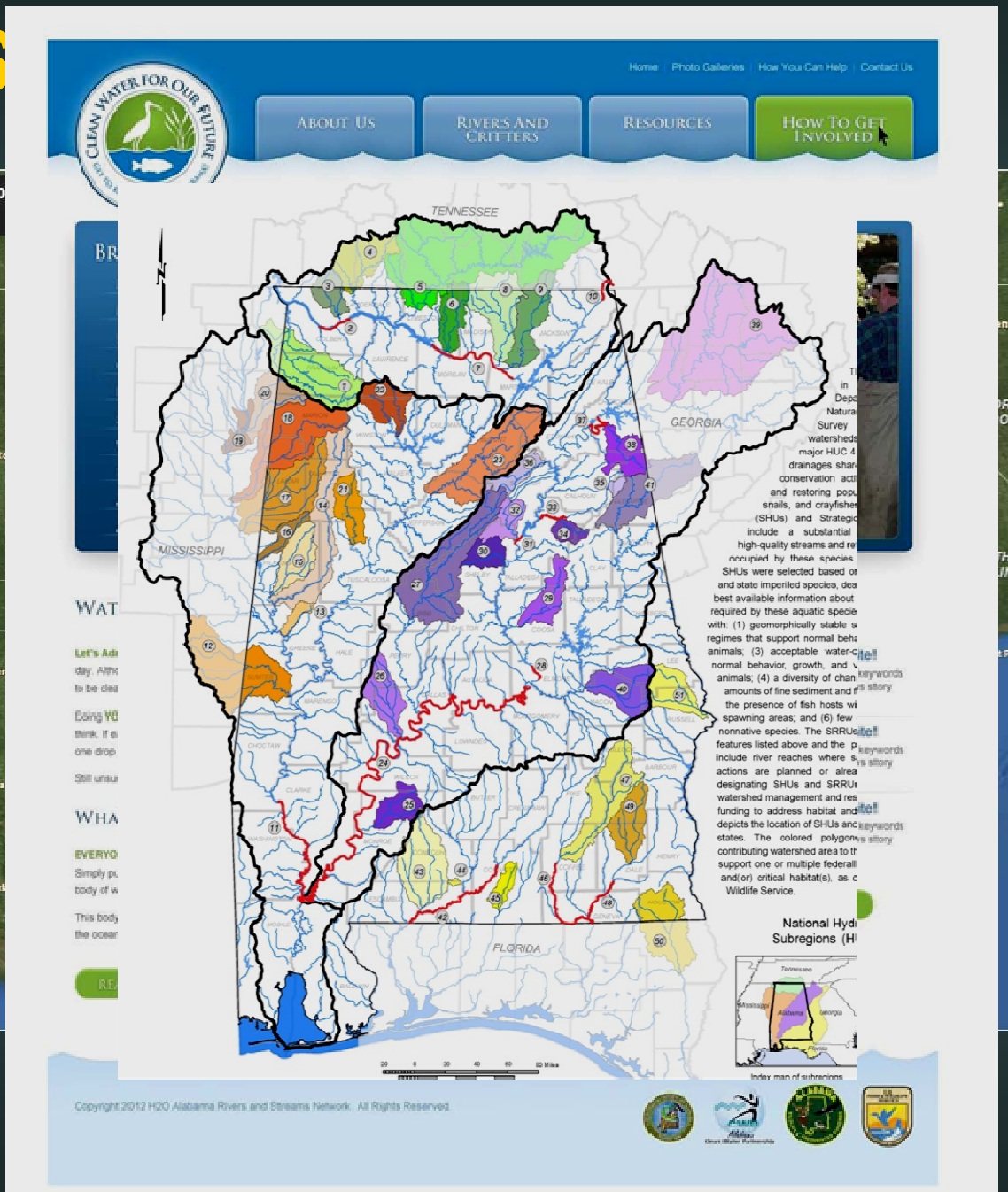
Assess Restore Recover Monitor

Performance measures for success

- *Improved biological condition*
- *Improved water quality*
- *Improved status of imperiled fauna and flora*
- *Reduced pollutant loadings*
- *Restored habitat*
- *Restored natural water flow regimes*

Next S


USGS
FWS Alabama Mussel Map
Beta Version
Zoom History
Rogers
Springdale
Fayetteville
Fort Smith
ARKANSAS
Little R
Longview
Shreveport
Tyler
LOUISIANA
Alexandria
The Woodlands
Beaumont
Lake Charles
Houston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major HUC 4
drainages shar
conservation acti
and restoring popu
snails, and crayfishes
(SHUs) and Strategic
include a substantial
high-quality streams and re
occupied by these species
SHUs were selected based or
and state imperiled species, des
best available information about
required by these aquatic specie
with: (1) geomorphically stable s
regimes that support normal beha
animals; (3) acceptable water-c
normal behavior, growth, and
animals; (4) a diversity of chan
amounts of fine sediment and f
the presence of fish hosts wi
spawning areas; and (6) few
nonnative species. The SRRUs
features listed above and the p
include river reaches where s
actions are planned or area
designating SHUs and SRRUs
watershed management and rea
funding to address habitat and
depicts the location of SHUs and
states. The colored polygons
contributing watershed area to th
support one or multiple federall
and(or) critical habitat(s), as c
Wildlife Service.
National Hydr
Subregions (HU
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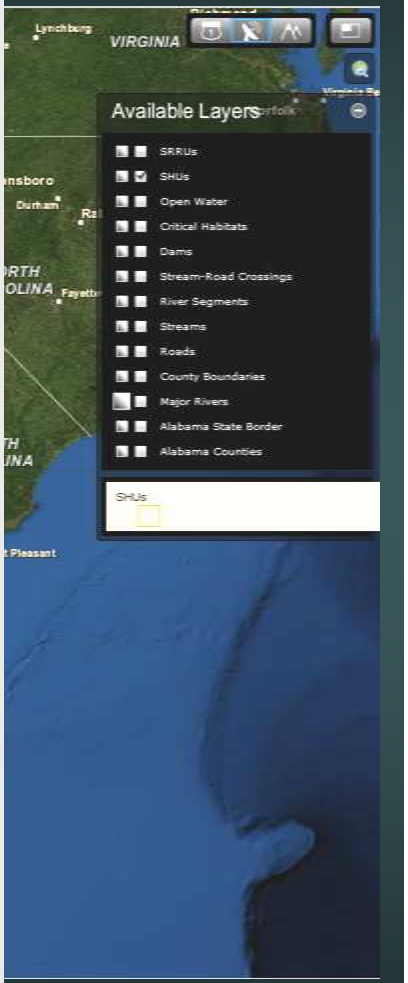
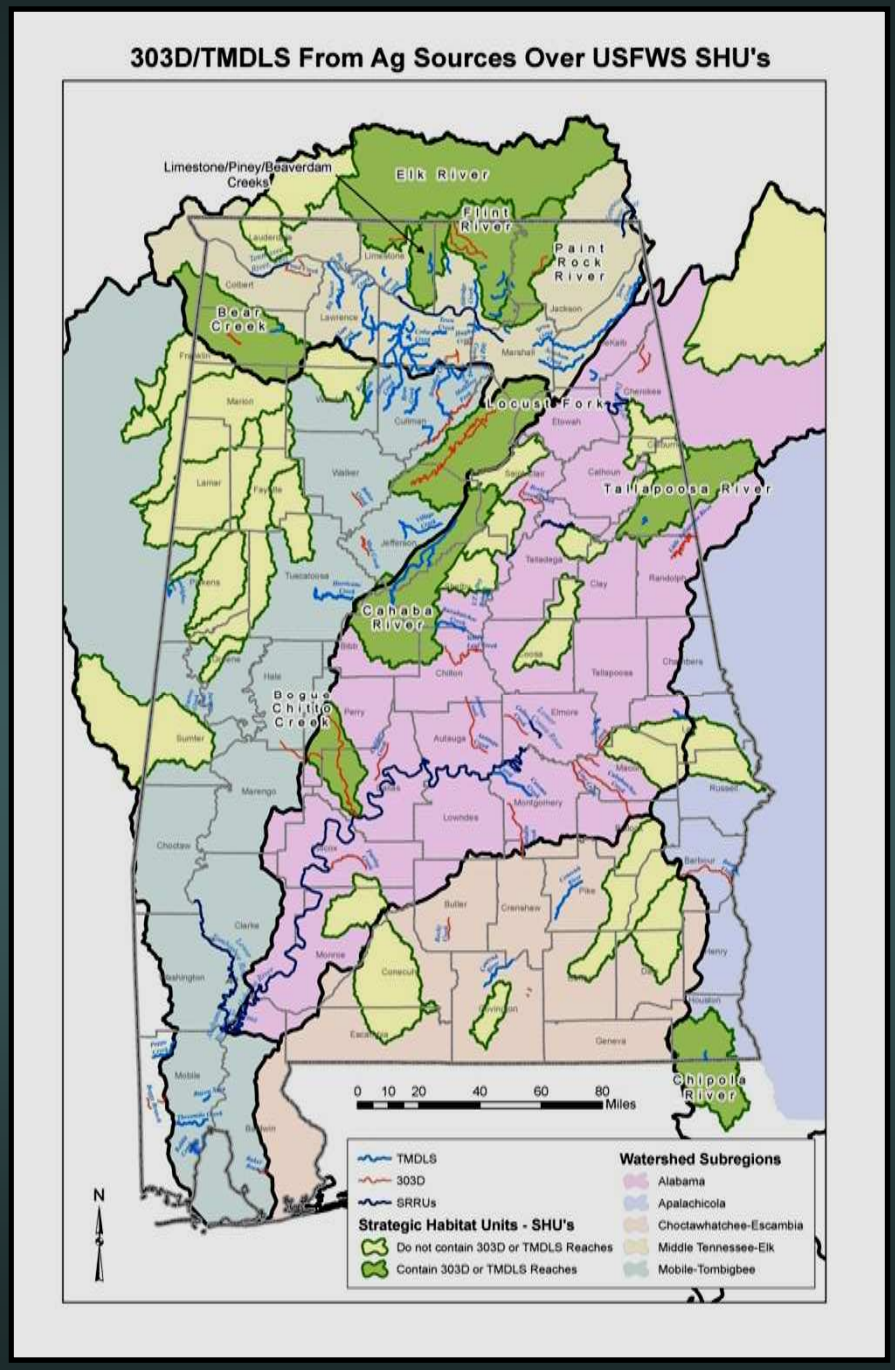

VIRGINIA
Lynchburg
Durham
Available Layers
SRRUs
SHUs
Open Water
Critical Habitats
Dams
Stream-Road Crossings
River Segments
Streams
Roads
County Boundaries
Major Rivers
Alabama State Border
Alabama Counties
SHUs

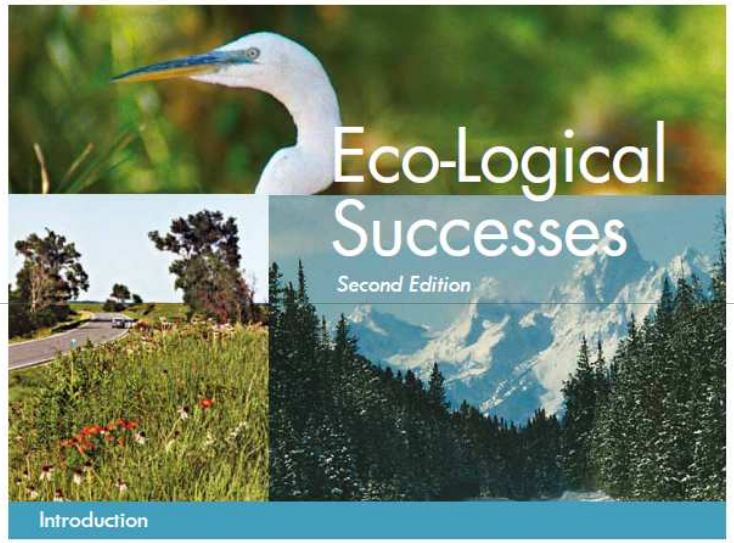
SHU concept is being used by our partners.

This map was used in a meeting with NRCS to assist them in distributing EQUIP funds.

We focused on four watersheds and used the 374 species list to identify opportunities for conservation activities



FHWA Publication Highlights SHC/LCC Approach to SHU Project



Introduction

In 2006, leaders from eight Federal agencies signed the interagency document *Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects*. *Eco-Logical* is a document that outlines a shared vision of how to develop infrastructure projects in ways that are more sensitive to terrestrial and aquatic habitats, promoting advanced mitigation and early consideration of critical environmental resources.

The eight *Eco-Logical* signatory agencies are:

- Bureau of Land Management (BLM)
- Federal Highway Administration (FHWA)
- National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service
- National Park Service (NPS)
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Agriculture Forest Service (USFS)
- U.S. Environmental Protection Agency (EPA)
- U.S. Fish and Wildlife Service (USFWS)

Since signing the document, the eight agencies have continued to collaborate on efforts to promote the principles embodied in the *Eco-Logical* document. In January 2011, FHWA published the first *Eco-Logical Successes* document. The document featured at least one of each signatory agency's strategic environmental programs, projects, and efforts that are either directly related to or share the vision set forth in *Eco-Logical* and identified potential joint projects and opportunities for collaboration among the agencies. This, the second edition of *Eco-Logical Successes*, focuses on two agency programs: BLM's Landscape Approach and USFWS's Strategic Habitat Conservation Framework and Landscape Conservation Cooperatives, and provides a more in-depth discussion of these two programs and their linkages to *Eco-Logical*.

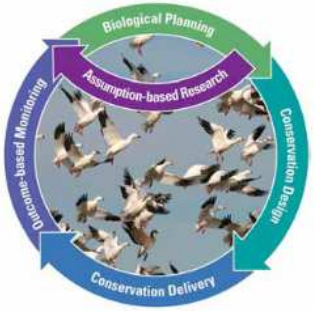
U.S. Fish and Wildlife Service Strategic Habitat Conservation Framework and Landscape Conservation Cooperatives

Strategic Habitat Conservation Framework

USFWS uses the Strategic Habitat Conservation (SHC) framework to encourage conservation and habitat management decisions based on landscape-scale resource threats. The goal of SHC is to improve the efficiency and transparency of natural resource management agencies by using a collaborative, adaptive process that strategically targets priority species. The SHC framework is a way of approaching conservation delivery where each conservation action contributes to strategic goals and objectives determined through data-driven modeling of existing conditions, resources, and opportunities. Conservation activities are monitored for their effectiveness and research is conducted into the relationships that form the basis for planning and delivery decisions. The results of monitoring and research are used to inform future conservation planning and delivery.

SHC is an iterative process with five consecutive elements that feed into each other, leading to continually improving results. The five elements are:

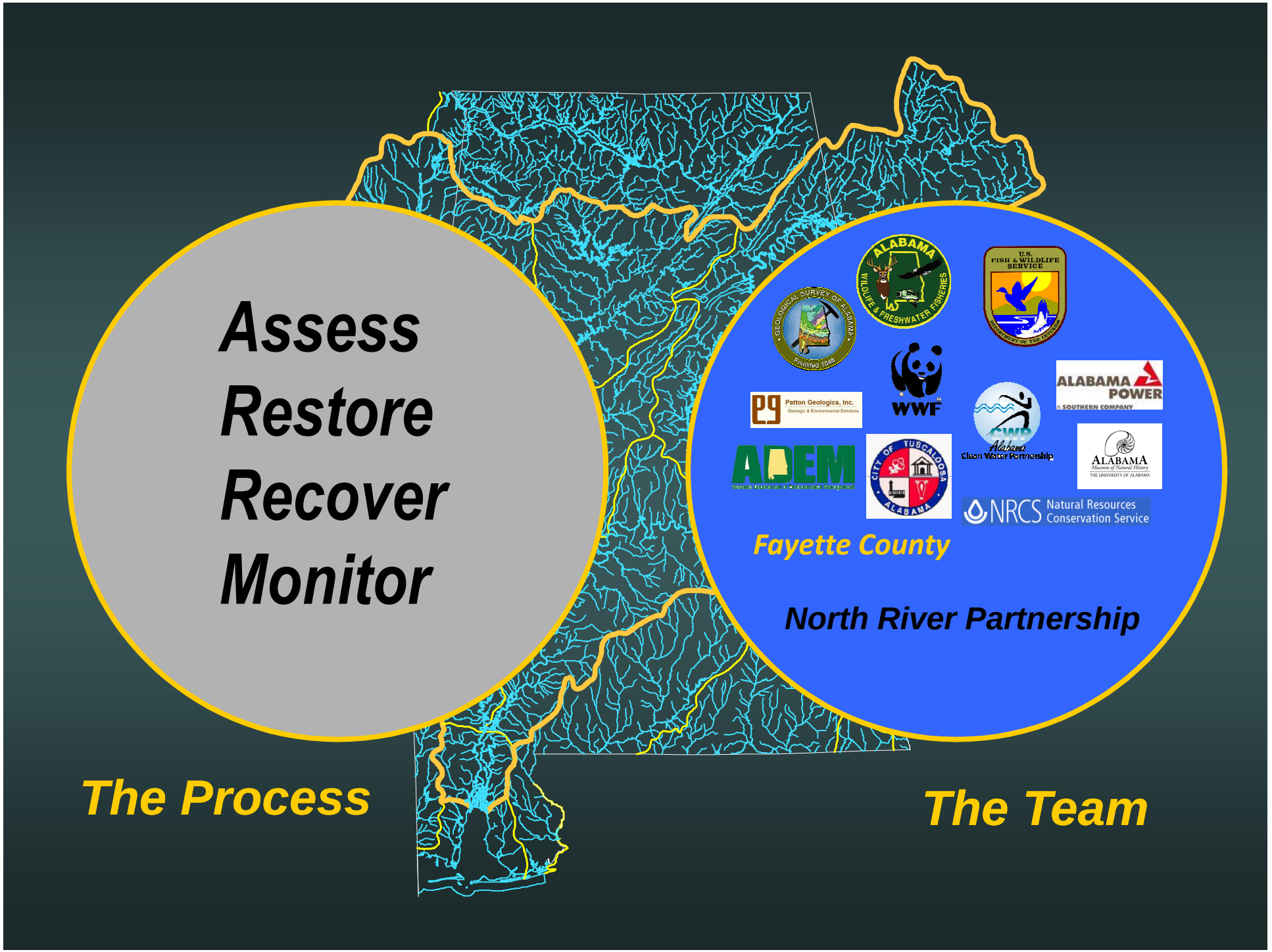
- **Biological Planning:** Identify priority resources, determine associated population objectives, and model relationships between habitat and populations.
- **Conservation Design:** Identify priority areas for conservation and determine population-based objectives.
- **Conservation Delivery:** Implement conservation actions through partnerships and programs.
- **Outcome-Based Monitoring:** Evaluate the success of conservation delivery activities to inform future Biological Planning, Conservation Design, and Conservation Delivery.
- **Assumption-Based Research:** Test standard assumptions used in Biological Planning to improve future activities.



USFWS Strategic Habitat Conservation Framework. Source: USFWS

Landscape Conservation Cooperatives

Building on the SHC concept, USFWS is developing a national network of public-private partnerships called Landscape Conservation Cooperatives (LCCs). There are 21 LCCs; each one covers a large area that roughly corresponds with an aggregation of existing Bird Conservation Districts. The LCCs cover all 50 United States and extend across international borders into neighboring areas of Canada, Mexico, and several Pacific Island Territories. Each LCC will provide scientific and technical support while facilitating partnerships that enable resource agencies and stakeholders to deliver more efficient landscape-scale conservation through collaboration. The role of the LCCs is to identify best practices, connect the efforts of conservation agencies, identify gaps in conservation delivery, avoid duplication through improved conservation planning and design, and to disseminate high-quality information.


Assess
Restore
Recover
Monitor
The Process
Fayette County
North River Partnership
The Team